

REMARKS

Claims 10-29 are pending in the application. By this Amendment, claims 1-9 are cancelled, and claims 10-29 are added.

I. Formal Matters

The Office Action objects to the specification because of various informalities. Enclosed herewith is a substitute specification, as well as a mark-up of the originally filed specification to show where the changes have been made. The Examiner is requested to replace the originally filed specification with the enclosed substitute specification. No new matter has been added.

The Office Action rejects claims 1-9 under 35 U.S.C. §112, second paragraph, as allegedly indefinite. By this Amendment, claims 1-9 have been cancelled. Thus, this rejection is moot.

II. Art Rejections

The Office Action rejects claims 1-9 under 35 U.S.C. §102(b) over Neckel (U.S. Patent No. 2,224,606). As noted above, claims 1-9 have been cancelled. Thus, this rejection is moot.

III. New Claims 10-29

By this Amendment, Applicant has added new claims 10-29 to the application. New claims 10 and 22 are independent claims directed to a multistacker. Claims 11-21 depend from claim 10, and claims 23-29 depend from claim 22.

It is respectfully submitted that independent claims 10 and 22 recite features that are neither shown nor suggested by the references of record. For instance, none of references of record disclose a multistacker which includes a movement plate and a plurality of tray plates

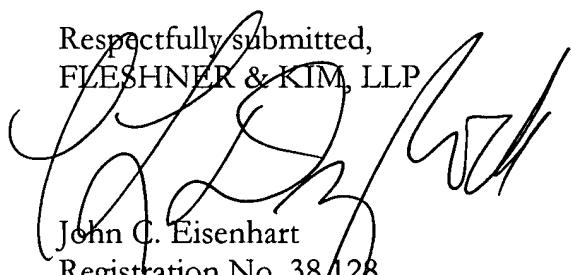
stacked on the movement plate, as recited in claims 10 and 22. Dependent claims 11-21 and 23-29 are allowable for at least the same reasons, and for the additional features they recite.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, John C. Eisenhart, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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Enclosures:

Mark-up of Original Specification
Substitute Specification

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Date: March 26, 2002

TITLE OF THE INVENTION

MULTI-STACKER FOR A HANDLER



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BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a multi-stacker of a handler for classifying and stacking a test tray served with a device tested by the test [and more] particularly to a multi-stacker of a handler in which after a device served in a test tray is [contacted with a test of a test site to be tested] and is classified [to be served on] each test tray according to the classification for unloading.

Description of the Prior Art

In general, a [produced] device [in the] manufacturing process is, in regular sequence, fed by an elevator of a horizontal or vertical handler to [be tested by] a tester.

As the result of testing [the] good [device is] separated from [the] bad [device] so that the only good [device] is outputted. ↑ devices

A [The] device for being tested its performance is [served] in a test tray [to move toward a test portion] and is contacted with a tester [to be tested]. moved to a test position

At this time, the tested device is classified according to a classification and the classified device is again classified to be as it is unloaded by a multi-stacker. an unloading base plate, which is secured to the convention handler frame to by space includes

As shown in Figs. 1 and 2, a conventional handler frame 10 [is] at the upper portion thereof, secured with] a plurality of mount brackets 108. [An] unloading base plate 104 [formed] ^{extends} longitudinally with a long-hole 106 ^{formed} therein [is disposed] ^{extending} perpendicular to the handler frame 10 [by the mount bracket 108. [Furthermore,] the long hole 106 of the unloading base plate 10 [is inserted with one end of the tray plate 110 to be placed the test tray thereon and is inserted with a plurality of tray plates 110, in regular sequence, at a predetermined portion therefrom. ^{plurality}

Fact
The tray plate 110 is provided with a plurality of pins 118 so that the test tray is correctly placed thereon. The tray plate 110 is, at one side thereof, formed with a tray guide 116 to be placed with the test tray without movement.

Furthermore, the tray plate 110 is, at the lowest portion thereof, installed with a belt bracket ¹²⁰ thereby to move up/down by the belt (not shown) ^{The} ^{a lower} ^{further provided}

which is moved up and down on a back side of

Furthermore, a pulley bracket 122 is installed (at) the unloading base plate 104 (on the belt bracket 120). The pulley bracket 122 is installed with a shaft 126 coupled with a pulley 124 ^{which is moved} to move by a motor (not shown). Therefore, the pulley 124 coupled to the shaft 126 is rotated according to the rotation of the motor so that the belt (not shown) wound ^{around} the pulley 124 is rotated thereby to move [up/down] the belt bracket 120. Accordingly, the tray plate 110 moves up/down. ^{up and down}

plurality of ^{are moved up and down}

Meanwhile, a stopper base 128 is installed at the lower portion of the pulley bracket 122. The pulley bracket 122 is installed at the outside of the unloading base plate 104. The stopper base 128 is, at the right portion thereof, secured with a cylinder 132 to move up/down. The stopper 130 is the right side thereof, connected to the lower end of the cylinder 132 secured to the stopper base 128. The tray plates 110 moves up/down by the belt not shown rotating by the rotating power from the motor.

At this time, "L"-shaped stopper 130 is, at the left end thereof, formed with a PAW to control a rising height when the tray plate 110 moves up. Furthermore, the stopper 130 is, at the central portion thereof, secured by the hinge (to move up/down) by the cylinder 132. ^{The} ^{on a} ^{provided} ^{plates} ^{are moved in} ^{and can be moved up and down}

The multi-stacker having the above-construction is installed with a plurality of tray plates ^{positioned at intervals} thereby causing the space ^{an increase in} to be increased therefor. Furthermore, because the position of the multi-stacker is controlled by the cylinder, the apparatus ^{has a} becomes complicated [its] construction. ^{required}

Furthermore, it is very difficult to stack the classified device and the classification of the device can not be ^{varied}.

SUMMARY OF THE INVENTION

Accordingly, the present invention has been invented ^{to} solve the above problems. It is an object to provide a multi-stacker of a handler, in which a stacker is simplified [its] in construction and an apparatus becomes small ^{is small in} its size, to stack a test tray served with

variously classified devices so that correct and rapid stacking ^{operations} (operation) can be accomplished.

To accomplish above object, the present invention provides a multi-stacker of a handler comprising: a stacker frame installed longitudinally on a handler frame and coupled with a side plate; a tray stacking portion for stacking a test tray served with a classified distributed device in the stacker frame; a guide for determining the position of a tray plate placed on the test tray and ^{and at} _{installed} four edges ^{of the test tray} for preventing the tray plate from being deviated; and a tray up/down movement means for moving up and down along the inside of the guide and for unloading the test tray ^{which has been} served with a classified device. deviating from a predetermined position

The stacker frame is, at ^a the lower portion thereof, _{installed} with a support plate. ^{provided}
(and) the support plate is, at ^a the inside of the lower portion thereof, _{installed} with a ^{configured} _{an} stopper to move transversely. ^{provided}

The stopper moves transversely by a linear cylinder _{installed} at ^{means of} the upper portion thereof. The stopper is, ^{at} _{an} the entire surface thereof, formed with a protrusion to fix the tray plate.

The tray stacking portion ^{includes} is placed with a plurality of tray plates to classify and stack the test tray served with the classified device.

The tray up/down movement means comprises: an up/down movement plate ^{positioned thereon} placed thereon with a plurality of tray plates; a LM rail secured ^{at} _{its} one side with a rack and installed longitudinally at ^a the lower portion of the up/down movement plate; a LM block installed longitudinally along the LM rail for sliding; a bracket secured to one side of the LM block and secured to ^a the lower portion of the handler frame; a motor provided with a pinion gear for moving ^{up/down} the up/down movement plate (with) a rack of the LM rail; and a bracket ^{provided} inserted with the motor for rotating the pinion gear.

The up/down movement plate is, at ^a the lower portion thereof, connected ^{with} to a top side of the LM rail and is _{installed} with the support plate for attenuating ^{the} distortion and vibration of the up/down movement plate.

The LM rail is, at ^a the lower portion thereof, _{installed} with a pair of support ^{provided}

plates for attenuating the shock and vibration of the LM rail.

The guide moves transversely by the linear cylinder for easy the test tray to be controlled.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and aspects of the invention will become apparent from the following description of embodiments with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a conventional multi-stacker of a handler;

Fig. 2 is a side view of Fig. 1;

Fig. 3 is a perspective view of the multi-stacker of the handler according to the present invention;

Fig. 4 is a disassembly perspective view of Fig. 3;

Fig. 5 is a perspective view of an up/down movement means to move up/down a multi-stacker of a handler, according to the present invention

Fig. 6 is a side view of Fig. 5; and

Fig. 7 is a side view for the construction of the multi-stacker.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 3 is a perspective view of the multi-stacker of the handler according to the present invention; Fig. 4 is a disassembly perspective view of Fig. 3; Fig. 5 is a perspective view of an up/down movement means to going up/down a multi-stacker of a handler; Fig. 6 is a side view of Fig. 5; and Fig. 7 is a side view for the construction of the multi-stacker.

Referring to Fig. 3 to Fig. 7, a multi-stacker of a handler according to the present invention comprises: a stacker frame 12 installed longitudinally on a handler

10 plurality of and trays
frame and coupled [with a side plate 14] to a tray stacking portion 98 for classifying and stacking a test tray served with a classified device according to the classification in the stacker frame 12. each potentially classified stacker
guide 16 for determining the position of a tray plate 22 placed on the plurality of test tray and installed four edges for preventing the tray plate 22 from being deviated; and a tray up/down movement means 96 for moving up and down along the inside of the guide 16 and for unloading the test tray served with a classified device according to the classification the tray plate 22.

of the tray plate 22 to

deviating out of a correct position

The stacker frame 12 is, at the lower portion thereof, installed with a support plate 31 and the support plate 31 is, at the inside of the lower portion thereof, installed with a stopper 42 to move transversely.

(The stopper 42 moves transversely) by the action of a linear cylinder 44 installed at the upper portion thereof.

The stopper 42 is, at the entire surface thereof, formed with a protrusion to fix hold the tray plate 22.

The tray stacking portion 98 is placed with a plurality of tray plates 22 to classify and stack the test tray served with the classified device.

24 The tray up/down movement means 96 comprises an up/down movement plate placed thereon with a plurality of tray plates 22, a LM rail 26 secured with a rack 28 at [its] one side, and installed longitudinally at the lower portion of the up/down movement plate 24; a LM block 34 installed longitudinally along the LM rail 26 for sliding; a bracket 32 secured to one side of the LM block 34 and secured to the lower portion of the handler frame 10; a motor 38 provided with a pinion gear 36 for moving up/down the up/down movement plate 24 with a rack 28 of the LM rail 26; and a bracket 40 inserted horizontally with the motor 38 for rotating the pinion gear 36.

connected to up and down, the pinion gear 36 being engaged with

The up/down movement plate 24 is, at the lower portion thereof, connected with the top side of the LM rail 26 and installed with the support plate 30 for reducing the distortion and vibration of the up/down movement plate 24.

The LM rail 26 is, at the lower end thereof, installed with a pair of support plates 33 for attenuating the shock and vibration of the LM rail 26.

reducing

A [More] ^{more detailed} [detail] description [for] ^{of} the multi-stacker having the above construction follows.

The base 100 of the handler [is formed with] ^{has} a square-shaped frame and is at the ^{is positioned} ~~an~~ upper portion thereof placed with a handler frame 10.

The handler frame 10 is, at the ^{an} right upper portion thereof, installed with the multi-stacker 102. The multi-stacker 102 serves to classify and stack each test tray ^{ing} served with a classified device after test.

The ^{of the} multi-stacker 102 is installed with the ^{has a} stacker frame 12 ^{provided} having a four sides-opened box shape and is, at right and left sides thereof, [installed] with a pair of support plates 31. The support plate ^{31 are} 22 is, at the ^{an} lower portion thereof, [installed] with ^{provided} [the] stopper for fixing the ascending tray plates 22.

Furthermore, the stopper 42 is, [at the] ^{on an} entire surface thereof, [formed] with [the] ^{provided} a ^{aa} protrusion 43 and is, at the ^{an} upper portion thereof, [installed] with the linear cylinder 44 ^{which moves} ^{connected to} for moving the stopper toward right and left.

Meanwhile, the support plate 31 is, at the ^{an} lower portion thereof, installed with [the] side plate 14, facing each other from ^{the} right and left, and is, at the ^{an} inside thereof, [installed] ^{provided} with the tray stacking portion 98 for stacking the tray plates 22 formed with the ^a locking groove 45 ^{on} both sides.

The tray stacking portion 98 is constructed so that the stacker frame 12 is, at four edges thereof, secured with the guide 16. The sensor 20 is secured by the sensor bracket 18 [to be secured] at one side of the guide 16. Furthermore, the tray stacking portion 98 is constructed so that a plurality of tray plates 22 is continuously stacked along the ^{for up/down movement} inner surface of the guide 16 to move up/down and is, at the ^{an} lower portion thereof ^{provided} installed with the tray up/down movement means 96 to support the tray plates 22 and to move up/down for classifying and stacking the test tray ^s served with [the] ^A classified device ^{which are each} between the tray plates 22.

Furthermore, it is easy to attach or detach the tray plate ^s so that the number of classification level for stacking the test tray ^s can be changed [in variety].

The tray up/down movement means 96 supports the tray plates 22. The up/down movement plate 24 is, at the lower portion thereof, secured with the LM rail 26 and is, at the upper end thereof, [installed] ^{provided} with the support plate 30 to connect the up/down movement plate 24 to the LM rail 26 and to [attenuate] ^{the} distortion and vibration of the up/down movement plate 24. reduce

The LM rail 26 is, at one side thereof, secured with the rack 28 formed with a plurality of gears, and is, at the other side thereof, [installed] ^{provided with} the LM block 34 thereby to move up/down the LM rail 26. The LM block 34 is secured to the handler frame 10. Furthermore, the LM rail 26 is, at the lower end thereof, ^{up/down} [installed] ^{provided} with a pair of support plates 33 to attenuate the vibration and shock of the LM rail 26.

At this time, the motor 38 is installed ^{on} the bracket 40 secured to the handler frame 10. The pinion gear 36 [for rotating] ^{configured to be rotated} by the rotating power from the motor 38 is engaged with the rack 38.

Accordingly, the rack 28 [repeats] ^{is moved} up/down [movement] by the rotation of the pinion gear 36.

The operation of multi-stacker having the above-construction will now be described.

The tested device at the test site is separated ^a a good device from a bad device, and is classified according to the classification. When the test tray ^{is} served with the classified device, the motor 38 drives the pinion gear 36 to rotate thereby to move up the rack 28.

At this time, the LM rail 26 secured with the rack 28 is guided by the LM block 34 to move up/down, and, at the same time, the tray plates 22 [placed] ^{on} the up/down movement plate 24 [is ascended] ^{are moved} toward the inside of the stacker frame 12. ^{positioned}

The stopper 42 ^{of tray 22} is ^{and secured to} ascended into the locking groove of an ^{ascended} tray 22. The ascended tray plate 22 is its protrusion 43 [inserted] ^{into} to be secured to the ^{ascended} tray 22. ^{locked}

Because the stopper 42 ^{is} moves forward and backward in right and left directions

by the linear cylinder 44, the linear cylinder 44 operates the stopper 42 to move forward when the tray plate 22 on the up/down movement plate 24 ascends.

At this time, the protrusion 43 of the stopper 42 is coupled with the locking groove 45 of the tray plate 22 thereby ~~secures~~ ^{are} the upper tray plate 22 of the desired tray plate 22 among the classified tray plates 22.

Meanwhile, other tray plates 22 moves down by a predetermined distance along the up/down movement plate 24, the test tray is placed on the tray plate 22 and, at the same time, the up/down movement plate 24 again ascends to contact with the tray plate 22 so that the stopper 42 moves backward to release the tray plate 22.

Accordingly, the up/down movement plate 24 is moved down with the test tray.

If the test tray ^{is to be} served with ~~level II of the~~ classified device, the tray plate 22 disposed at the highest portion is secured by the stopper, the test tray is placed on the second tray plate 22 to move down. By repeating the above operations the test tray served with the classified device can be unloaded.

According ~~to~~ the present invention having the above description simplifies its construction and ^{easily} stacks a classified device as well as sets its position correctly and rapidly.

Having described specific preferred embodiment of the invention with reference to the accompanying drawings, it is to be understood that various changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of the invention as defined in the appended claims.

ABSTRACT OF THE DISCLOSURE

[The present invention relates to a ^A ~~for~~ ^{is provided} multi-stacker ~~of~~ a handler in which after a device served in a test tray is ~~contacted with a test of~~ ^{tested at} a test site ~~to be tested~~ and is classified ~~thereby to unload on~~ each test tray according to the classification. The present invention provides a ^A ~~for~~ ^{is unloaded} multi-stacker ~~of~~ a handler ^{including} ~~with~~ a stacker frame installed longitudinally on a handler frame and coupled ^{to} ~~with~~ a side plate ^{includes} a tray stacking portion for stacking a test tray served with a classified ~~distributed~~ device in the stacker frame; ⁺ a guide for determining ^{the} position of a tray plate placed on the test tray and installed ^{at} four edges for preventing the tray plate from ^{being deviated} ~~from~~ ^{an} ~~the~~ inside of the guide and for unloading the test tray served with a classified device.

~~test trays~~

deviating from
a correct position
pre determined